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MAYNARD OWEN WILLIAMS

WITH A HAMMER, THIS PESHAWAR ARTISAN MENDS, NOT BREAKS, CHINAWARE FOR HIS FELLOW PAKISTANIS (Bulletin No. 2)

Bulletin No. 1, October 13, 1947

Two New Nations Arise in Ancient India

OFTEN-conquered India now is free. The time-worn face of the overcrowded Asiatic subcontinent is creased with new boundary lines as Hindus and Moslems divide the erstwhile British "jewel of empire" between them.

Great Britain, last of many foreign rulers, voluntarily withdrew from India on August 15, offering the 400,000,000 polyglot inhabitants complete independence with a choice of British dominion status.

A New Geographical Name

The Indians, divided on religious lines, separated into two unequal dominions. The Hindu "Dominion of India," built around the nucleus of 12 of the 17 former British provinces, comprises roughly the large central portion of the peninsula.

The Moslem "Dominion of Pakistan" (see Bulletin No. 2), split into two fragments a thousand miles apart, lies in the extreme northwest and northeast areas.

(Thus a new geographical name—Pakistan—is born, and the old name —India—now technically applies only to the Hindu Dominion of India.)

The 562 big and little Native States were invited to join one or the other of the dominions. Most of them have lined up on the Hindu side. A handful threw in their lot with Pakistan. A few, notably Hyderabad and the State of Jammu and Kashmir, are still undecided.

The Hindus in the entire peninsula number about 300,000,000, compared with perhaps 80,000,000 Moslems. Smaller minority groups were swallowed up in the two-way division. The Hindu dominion, more than three times the size of Pakistan, includes most of the peninsula's raw materials and industrial plants.

Hindu Dominion Has Huge Iron and Steel Plant

Calcutta, the jute manufacturing center and big east-coast port, falls within the Hindu portion of partitioned Bengal. Most of India's famed jute, however, grows in the Pakistan part of the province. Two-thirds of India's huge cotton-milling industry is in and around the west-coast Hindu port of Bombay.

Also in Hindu territory—at Jamshedpur, west of Calcutta—is the long-Indian-owned Tata Company, which operates one of the world's largest iron and steel works. Jamshedpur plants are the heart of India's industrial life. During the war years they turned out annually a million and a half tons of pig iron and half as much tonnage in steel.

There are extensive supplies of coal, iron, and manganese, essential to heavy industry, in the Jamshedpur region, as well as scattered about in central and other areas of the far-flung Hindu territory.

India's famous sheet mica, vital in radio and aircraft engines, comes largely from the Hindu sections of Bihar and Madras. During the

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EDDA REINHARDT

MASSED AT VIGO'S WATERFRONT ARE CROWDS OF PEOPLE AND HOUSES

Small overloaded fishing boats press to the sea wall with their cargoes. From the heights above, stone houses with ornate balconies and many windows crowd to the water's edge. As a contrast, a marked lack of congestion is shown in the street traffic. A lone truck provides an extra means of transportation for the fish just brought in. For the most part, the catch is carried on the heads of the sturdy women of Vigo (Bulletin No. 5).

Bulletin No. 2, October 13, 1947

Pakistan Is Divided State in Divided Land

THE new Dominion of Pakistan, born full-blown as the most populous state in the Moslem world, is at present the only country on earth whose home territory is not continuous by land.

In setting up independence after the British withdrawal on August 15, the Indians established two new states—the Dominion of India for the Hindus and Pakistan for the Moslems. Following lines of local majorities, Pakistan was created in two unequal pieces separated by 1,000 miles of Hindu domain.

Bengal Region Remote from Rest of Country

The two parts lie at opposite northwest and northeast corners of India. The larger northwest area, somewhat smaller than Texas, has been carved from the Punjab, the North-West Frontier, Sind, and British Baluchistan. These provinces, though counting about 37,000,000 persons, contain some virtually empty areas.

The northeast section, "Pakistan's East Prussia," includes only a little more than half of teeming, humid Bengal Province, plus the small Sylhet district of Assam. Its lowlands, rich in jute and coal, are remote in more ways than actual distance from the mountainous, arid reaches in western Pakistan.

The northwest area is famous as the land of Kipling's border ballads and hill tales. The new country reaches from the sultry delta coast of the Arabian Sea to the perpetually snow-shrouded peaks of the Afghanistan frontier. Its people include nomad herdsmen, settled farmers, industrial workers in crowded settlements, and lawless men of the hills dressed in sheepskin jackets and baggy trousers, carrying homemade rifles.

Famed Khyber Pass, in the strategic Afghan border region, is the chief gateway to India from Central Asia. Through this "sword cut in the hills" came invading armies of Persians, Greeks, Tatars, and Moguls. The old path of trade and culture still is followed by swaying camel caravans and migrating shepherds, along with battered trucks overloaded with bales of skins, cereals, and tea.

Rebellious Tribesmen Roam the Barren Hills

Peshawar, capital of the North-West Frontier Province and Khyber's guardian, is an *Arabian Nights* showcase (illustration, cover). Its bazaars display, next to American canned goods, such assorted items as ground curry powder and hob-nailed mountaineer sandals, copper jars, silks, carpets, and fighting quail with beaks and claws trimmed for combat.

In the province's barren hills, British Empire outposts and rebellious tribesmen with a talent for sniping maintained for generations an uneasy truce.

Sharing the Afghan border with the North-West Frontier Province, British Baluchistan stretches southwestward toward Iran for more than 700 miles. A rugged, lonely region, in which occasional green spots are like oases among the bare mountains, stony plains, and sun-baked deserts,

war, strategic minerals were discovered in the north-central states of the new Dominion of India.

One of these was beryl—a mineral that strengthens certain metals—which played its part in the development of the atom bomb. Another was bloc talc, valuable in making radar and other electronic equipment. The largest known deposits of thorium, a basic source of atomic power, are found in the lushly tropical Indian State of Travancore, which elected to join the Hindu dominion.

In bulk, the vast Dominion of India accounts for more food, farm (illustration, below), and forest products than Pakistan, although the latter contains much rice land in the northeast and extensive wheat fields in the northwest. The hundred-millions of people in the Dominion of India normally require heavy food imports, while the Pakistan areas have had a surplus of rice, wheat, and cotton.

NOTE: Regions that have become the Dominion of India may be located on the National Geographic Society's Map of India and Burma. A price list of maps may be obtained from the Society's headquarters, Washington 6, D. C.

For further information, see "India Mosaic" and "India's Treasures Helped the Allies," in the *National Geographic Magazine* for April, 1946; "India—Yesterday, Today, and Tomorrow," October, 1943*; "New Delhi Goes Full Time," October, 1942; and "Life with an Indian Prince," February, 1942. (*Issues marked with an asterisk are included in a special list of Magazines available to teachers in packets of ten for $1.00.*)

See also, in the GEOGRAPHIC SCHOOL BULLETINS, March 3, 1947, "Indian Princes Rule Fabulous Realms"; and "British Independence Offer Airs India's Complex Problems," April 15, 1946.

FRANK AND JOHN CRAIGHEAD

THE CHAFF BLOWS AWAY; JOWAR (MILLET) SEED FALLS TO THE GROUND; THE WOMAN WALKS INTERMINABLY BETWEEN THE MEN AND THE UNWINNOWED GRAIN PILE—BHAVNAGAR STATE, INDIA

Bulletin No. 3, October 13, 1947

Utah's Salt-Bed Speedway Once Was Lake

ON the Bonneville Salt Flats near Wendover, Utah, there is no speed limit! Resuming its prewar role as the site of automobile speed trials, this hard-packed glittering expanse west of Salt Lake City resulted from the recession of waters of a lake once as large as Lake Michigan.

Lake Bonneville, as geologists know it, was formed thousands of years ago in the continent's ice age. The lake covered western Utah, eastern Nevada, and southern Idaho for perhaps 25,000 years. The Great Salt Lake, Utah Lake, and Sevier Lake are its remnants.

Bonneville Flats Are Small Area of Great Salt Lake Desert

Varying levels of the ancient lake are plainly marked on the mountains surrounding the basin. The highest of more than 50 recognized terraces—beaches formed by the pounding of the ancient waves—is a full thousand feet above the present level of Great Salt Lake. It is called Bonneville Terrace. The Provo Terrace, at 575 feet, and the Stansbury Terrace, at 250 feet above Great Salt Lake, are prominent.

During cold wet centuries the basin filled. In hot dry eons the water evaporated, concentrating its salt. In the vast Great Salt Lake Desert, the Bonneville Salt Flats are one small area roughly 25 miles long and five miles wide.

As early as 1911, a pioneer speed demon whizzed 50 miles an hour on this concrete-hard surface that gleams like snow-covered ice. It was Ab Jenkins, native son of Utah, who put the Salt Flats on the map in the early 1930's by setting world speed records literally by the score. When Sir Malcolm Campbell in 1935 exceeded 300 miles an hour for the measured mile, the course gained undisputed leadership as a speedway.

Dream of 400 Miles an Hour Attained

In a series of tests between 1935 and 1939, the Englishmen, Campbell (illustration, next page), Capt. George E. T. Eyston, and finally John R. Cobb, the current record challenger as well as holder, pushed the measured mile record to 369.7 miles an hour—a mile in less than ten seconds. Their use of airplane engines is credited with contributing to improvements in British fighting planes.

Last month Cobb set a new record of 394.2 miles an hour. In doing so he reached the terrific pace of 403.1 miles an hour on his north run. He is not credited with the higher speed because the American Automobile Association Contest Board, official governing body of speed trials, requires two efforts in opposite directions over the measured mile. On his south run Cobb was clocked at only 385.6 miles an hour. The 394.2 figure is an average.

Climatic peculiarities make the flat salt bed the safest spot in the country to try such speeds. Moisture drawn to the salt surface by the heat of the sun recedes at night. It conditions the surface, leaving it uniformly hard and smooth for the speed runs, which are made early in the morning.

this portion of Moslem India is another turbulent tribal territory, long policed by British forces.

It, too, has its historic pass, guarded once by British-fortified Quetta. High, dry Quetta was a military training outpost during World War II, and a transport center for Soviet-bound supplies.

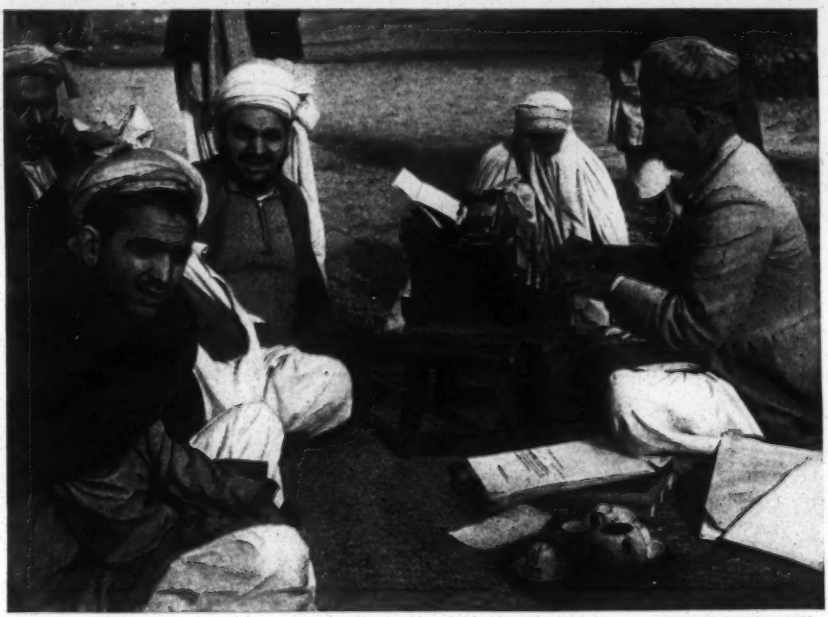
Through neighboring Sind flows the great Indus River on its last stretch to the Arabian Sea. In this province, once a near-desert land of sand and scrub, irrigation projects have reclaimed millions of acres of wheat, cotton, and rice production. Its capital, Karachi, is Pakistan's seat of government.

Also irrigation conscious is inland Punjab, the "land of five rivers," which, like Bengal, was divided between India and Pakistan. Its rich alluvial plains are the life-giving gift of the Indus and other streams rushing out of the Himalayas.

From the province names of the northwest came the term Pakistan. To the first letter of Punjab was added A for North-West Frontier Province Afghans, K for Kashmir, S for Sind, and "tan" for Baluchistan. Also, "pak" means "pure" and "noble" to Mohammedans.

NOTE: Areas of India that have been included in Pakistan may be found on the Society's Map of India and Burma.

For additional information, see "South of Khyber Pass," in the *National Geographic Magazine* for April, 1946; and "Law and Outlaw Mix in India's Northwest," in the GEOGRAPHIC SCHOOL BULLETINS, October 14, 1946. (Articles noted after Bulletin No. 1 also contain material on Moslem sections now Pakistan.)



MAYNARD OWEN WILLIAMS

PRIVATE BUSINESS IS TYPED IN THE PUBLIC SQUARES OF PAKISTAN'S CITIES

Most of the inhabitants of the new Indian country are illiterate. Here a public scribe pecks out a legal paper for the veiled woman (background) while turbaned men wait their turns. Moslem leaders report that veil-wearing and segregation of women are gradually disappearing customs.

Bulletin No. 4, October 13, 1947

Atlantic Expedition Studies Undersea Ridge

WHAT does the bottom of the ocean look like?

From available information, it is a gloomy and unattractive place. Darkness, of course, is complete. The water is cold. Gray, green, red, or blue mud, or an organic ooze, covers much of the floor to a depth ranging from hundreds of feet to several miles.

Two and three and four miles below water level, this vast expanse of soft and sticky sediment has not been seen by man, but it is important to him. The sea bed covers nearly three-fourths of the earth's surface. Buried in its murkiness are secrets of the earth's past.

National Geographic Society Helps Sponsor Ocean-floor Investigation

Just as trees record their age by an ever-increasing number of rings, the earth places clues to its history in the layers of sediment which have been slowly deposited through geologic time.

Collecting samples of this sediment for laboratory study was one of the achievements of a scientific expedition to the Mid-Atlantic Ridge sponsored jointly by the National Geographic Society, Columbia University, and the Woods Hole (Massachusetts) Oceanographic Institution. The expedition returned to Woods Hole on September 13 in the research ship *Atlantis* after surveying a 50,000-square-mile area of the Atlantic about equidistant between Bermuda and the Azores.

A mile or more below the surface stretches the Mid-Atlantic Ridge, a narrow S-shaped chain of undersea mountains (map, next page). Paralleling the coasts of North and South America, Europe and Africa, the range extends in a nearly continuous line from Iceland almost to Antarctica.

This ridge is one of the prominent features of the earth's crust. Its peaks rise two miles or so from the ocean floor. Some even break the surface of the water to form the Azores, Rochedos São Paulo (St. Paul Island), Ascension, and Tristan da Cunha.

Steel Tubes Lowered from *Atlantis* Trap Samples

How and when the Mid-Atlantic Ridge was formed are questions about which the expedition sought information. Samples of rock and sediment brought back are now under laboratory study. Before the final solution can be reached, scientists must accumulate a much greater mass of evidence than one expedition could collect.

To collect samples of the sediment on the ocean bottom, the scientists lowered steel tubes 10 and 15 feet long over the side of the *Atlantis*. Heavy weights drove the tubes into the mud, and a cross section of the sediment was trapped. These "cores" were brought to the surface and dried, with the original layering intact. The procedure is somewhat like plugging a watermelon to see how ripe it is.

In the ooze are the residue of minute seaweeds and the skeletons of microscopic animals which swim in the surface levels of the ocean. After these organisms die and sink to the bottom, traces of silica and calcium remain from their fragile shells. It may take a thousand years to build

The salt has a cooling effect on the tires. The surface is so hard that even if a tire is thrown, the tire-less rim of a speeding car will not cut through.

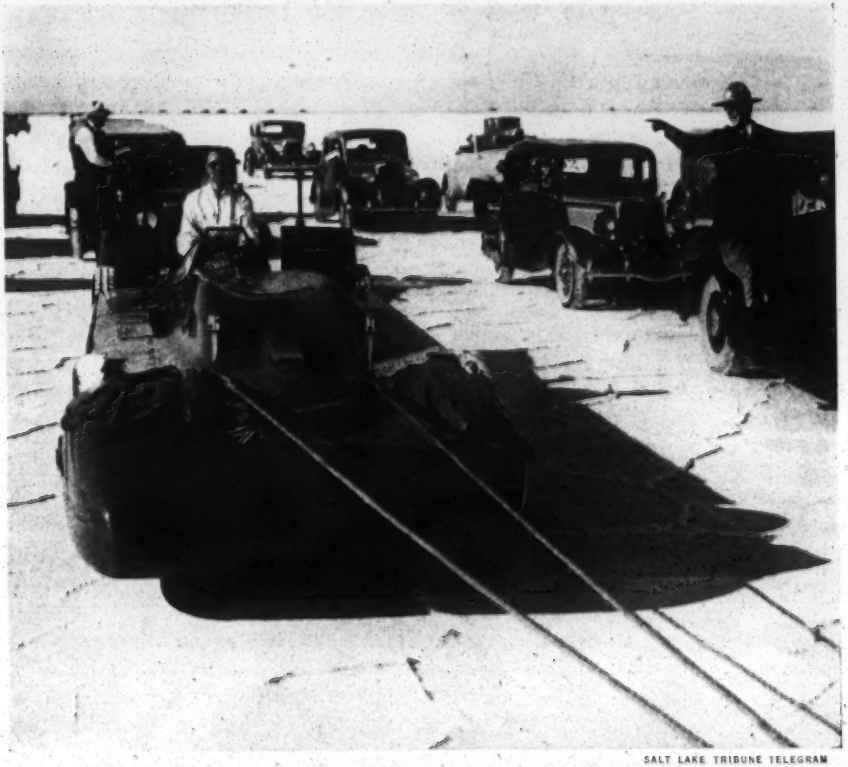
Over a far larger area of the Great Salt Lake Desert, Army aviation trainees practiced bombing in the war years without endangering property. They could land and take off at will, without need for concrete runways.

Cobb's record-breaking efforts, calling attention to Utah, have been a reminder that this year the Beehive State observes a centennial. It was just 100 years ago that Brigham Young, the Mormon leader, stood on the east rim of Salt Lake Valley and said, "This is the place." His followers quickly poured in and made the desert bloom—except for places like the salt flats which are still uninhabited.

NOTE: The Bonneville Salt Beds are shown on the National Geographic Society's Map of The Southwestern United States.

For additional information about the region, see "Utah's Arches of Stone," in the *National Geographic Magazine* for August, 1947; "Flaming Cliffs of Monument Valley," October, 1945*; and "Utah, Carved by Winds and Waters," May, 1936.

See also, in the GEOGRAPHIC SCHOOL BULLETINS, May 12, 1947, "Water and Minerals Alter Century-Old Utah."



SALT LAKE TRIBUNE TELEGRAM

ENGLISH GRIT AND UTAH SALT COMBINE TO PRODUCE WORLD SPEED RECORDS

Twelve years ago Sir Malcolm Campbell reached unheard-of ground speeds on the Bonneville Salt Flats in this 2,000-horsepower racer. Now his records have been far surpassed by another Englishman, John R. Cobb, who also used the Utah speedway for setting his current mark of 394.2 miles per hour.

Bulletin No. 5, October 13, 1947

"Silver-Plated" Vigo Harbor to Be Free Port

VIGO, with its "silver-plated" harbor, is to become a free port. Funds already have been provided to equip this ancient seaport, tucked away in the northwest corner of Spain, with warehouses for merchandise and the facilities needed to build up a foreign-trade zone.

Vigo stands just north of the Portuguese border. Its narrow, fjordlike bay (illustration, next page) extends about 20 miles inland from the Atlantic. Emerald valleys break the mountain wall that nearly encloses it. Fertile islands screen it from the sea. Cornfields and vineyards, orchards and tall eucalyptus trees paint the landscape a fresh and varied green.

Spanish Galleons Brought New World Treasure

The harbor was given its "silver-plating" in 1702 when a British fleet entered the bay and captured eleven treasure-laden ships which had just arrived from Spain's colonies in the New World. Other ships with their silver cargoes were sunk. For generations, treasure-seekers have tried in vain to salvage the bullion that vanished so long ago beneath the waters of the Riá de Vigo.

Spanish galleons brought across the Atlantic millions in gold, silver, and other treasure that the *conquistadors* looted in Central and South America. The convoyed "Silver Fleet" was long a source of wealth to the privateers out to weaken Spain's sea power.

Sir Francis Drake burned the town in 1589. After this disaster—a good example of locking the barn door too late—the citizens of Vigo began construction of fortifications. Completed in 1656, these walled the town into a triangular space with San Sebastián as the apex. This old fortress still dominates the heights above the harbor.

Although ships bound for the Western Hemisphere still put in at Vigo, the city's modern prosperity and rapid growth rest primarily on the great sardine-fishing fleet. This modern flotilla of powerboats brings tons of fish to packing houses that line the wharves. This thriving industry, together with the brisk transatlantic traffic brought by a number of steamship lines, has boomed Vigo in forty years from a town of 23,000 to one of Spain's largest and busiest cities. By the end of 1942, its population numbered more than 126,000.

Women Are Fish Porters and "Red Caps"

Men rule the fishing boats, but women dominate operations after the fish are landed. They often bid in the catch for the various packing houses, which employ hundreds of women.

Vigo's working women are noted for their vigor and their erect carriage. Barelegged fishwives, young and old, take the fish to the packing houses in large flat baskets. These they carry on their heads, as they do pails of water, baskets of chickens, and almost all heavy objects. They act as railway porters, handling baggage in the same way.

Near-by granite quarries provide material for most of Vigo's homes. Stone houses, with massive arcades providing shelter from sun and rain,

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up a half-inch layer of sediment, which rests undisturbed on bedrock.

Changes in the character of the layers furnish evidence of different climates and conditions at various geologic periods. Presence of skeletons of organisms known to exist only in warm waters, for example, may offer proof that a warm period followed a cold one.

The samples of sediment obtainable, however, extend only through the newest portion of the ocean's carpet. No method has yet been found of boring down to the underlying rock—the earth's ribs. Scientists must rely instead on sonic measurements to estimate the sediment's thickness.

A pioneer in that research is Professor Maurice Ewing of the geology department of Columbia University, leader of the National Geographic-Columbia-Oceanographic Institution expedition. He places six sound detectors near the surface of the water to record the echoes from a small bomb fired near the surface. Reflections from the ocean bottom, and also from the rock surface which lies beneath the mud, permit calculations of the thickness of the mud layer, and thus of the vast period of time during which it has been accumulating.

The *Atlantis* brought back more than a ton of rock which had been dredged from the steep slopes of the submarine mountains. A chart of the peaks and valleys of the Ridge also was made from sonic soundings.

IRWIN ALLEMAN

THE MID-ATLANTIC RIDGE, THOUGH SUBMERGED, IS ONE OF THE EARTH'S PRONOUNCED FEATURES

The way it repeats the curves of continental shore lines has suggested to some scientists that the ridge was left behind when the Western Hemisphere broke away from Europe and Africa. Others think it represents a pushing-together rather than a separation of land.

rise in tile-roofed tiers up the steep slopes from the sea wall (illustration, inside cover). Granite paves the steep zigzag streets of the old town.

In the newer part of Vigo, the result of the boom growth around the turn of the century, streets are wide and straight. In the surrounding countryside, farm buildings and fences are of granite, and supports for grapevines are made of the same material. The Galician villages along the bay, many looking down from high promontories, are also built of the native stone, which in this region is as plentiful as wood.

In addition to the fishing industry, Vigo's residents are supported by paper, flour, and lumber mills; sugar and oil refineries; tanneries, soap factories, and various other industries.

Vigo is on the railroad running from Tuy on the Portuguese border north to Coruña.

NOTE: Vigo may be located on the Society's Map of Europe and the Near East.

For additional information on Vigo and neighboring Spanish ports, see "A Modern Saga of the Seas," in the *National Geographic Magazine* for December, 1931.

ANGEL RUBIO

FISHERMEN, VIGO'S MOST NUMEROUS WORKERS, DRY THEIR NETS ON THE SUNNY SANDS

On the sands of an upriver cove in the outskirts of Vigo, fishermen take their ease on the gunwales of beached boats. Across the water rise the castle-crowned heights of the city. The Ría de Vigo, sometimes called Europe's finest natural harbor, compares in beauty with the magnificent harbor of Sydney, Australia. Upstream and downstream from the city, along the shores of this mountain-rimmed estuary, excellent bathing beaches are summer lure for residents of the busy commercial port.